

ENGINEERING STANDARD

587 - STRUCTURE FOR WATER CONTROL

Definition

A structure in an irrigation, drainage, or other water management system that conveys water, controls the direction or rate of flow, or maintains a desired water surface elevation.

Scope

This standard applies to the structures normally installed in a well planned irrigation or drainage system, wildlife facility or other water management system for the conveyance, flow control, or level regulation of water. It covers the planning and functional design of such water control structures, but not the detailed design criteria or construction specifications for specific structures. It does not apply to structural components or irrigation pipelines, or to subsurface drains, or to grade stabilization structures.

Purpose

To control the stage, discharge, distribution, delivery or direction of flow of water in open channels, or water use areas. Also used for water quality control such as sediment reduction or temperature regulation. These structures are also used to protect fish and wildlife and other natural resources.

Conditions Where Practice Applies

This practice applies wherever a permanent structure is needed as an integral part of an irrigation, drainage, or other water control system to serve one or more of the following functions:

1. To conduct water from one elevation to a lower elevation within, to, or from a ditch, channel, or canal. Typical structures: drops, chutes, turnouts, surface water inlets, head gates, pump boxes, stilling basins.
2. To control the elevation of water in drainage or irrigation ditches. Typical structure: checks.
3. To control the division or measurement of irrigation water. Typical structures: division boxes, water measurement devices.

4. To protect pipelines from the entry of trash, debris, or weed seed. Typical structure: debris screens.
5. To control direction of channel flow resulting from tides and high water or backflow from flooding. Typical structure: tide and drainage gates.
6. To control the level of water table or to remove surface or subsurface water from adjoining land, to flood land for frost protection, or to manage water levels for wildlife or recreation. Typical structures: water level control structures, pipe drop inlets, box inlets.
7. To provide water level control for recreation or similar purposes.
8. To convey water over, under, or along a ditch, canal, road, railroad, or other barrier. Typical structures: bridges, culverts, flumes, inverted siphons.
9. To modify water flow to provide habitat for fish, wildlife, and other aquatic animals. Typical structures: deflectors, chutes, cold water release, or structures to make pools and riffles.

Design Criteria

All designs and plans for structures shall be made and approved as shown in the Alabama Job Approval Classification Chart, AL-EN-1.

Structures shall be designed on an individual job basis, or applicable SCS standard drawings shall be adapted to meet site conditions and functional requirements. They shall be part of an approved overall engineering plan for irrigation, drainage, wildlife, recreational, channel improvement, or other similar purpose.

The plan shall specify the location, grades, dimension, materials, and hydraulic and structural requirements for the individual structure.

Care must be used to insure that the area's visual resources are not damaged. When watercourse fisheries are important, special precautions or design features may be needed to insure the continuation of fish migrations.

Protection

A protective cover of vegetation is required to minimize soil erosion, stream channel pollution, and facilitate maintenance; and shall be established on all areas as specified by the plans and specifications. Vegetative treatment shall be applied in accordance with the Guide for Critical Area Planting, Code 342. If soil or climatic conditions preclude the use of vegetation, and protection is needed, non-vegetative means such as mulches or gravel may be used.

When needed, fencing will be provided to protect the structures and vegetation from livestock damage.

Maintenance

A maintenance program will be worked out with the landuser to insure a useful life for the structure. Emphasis will be placed on control measures for vegetation, repair of structural measures, sediment and erosion control, as well as other measures needed to maintain effectiveness of the structures.

Plans and Specifications

Plans and specifications for installing structures for water control shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

References: Engineering Field Manual for Conservation Practices
National Engineering Handbooks

CONSTRUCTION SPECIFICATION

FOR

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Scope

This item shall consist of the clearing, excavation, backfill, masonry work, and other appurtenances required for the construction of the embankment and the disposal of all cleared and excavated materials.

Construction operations shall be carried out in such a manner that erosion, air, water, and noise pollution will be minimized and held with legal limits as established by state regulations.

Construction

The structure shall be constructed to achieve its intended purpose in accordance with approved plans and specifications for the job.